

Dec. 30, 1958

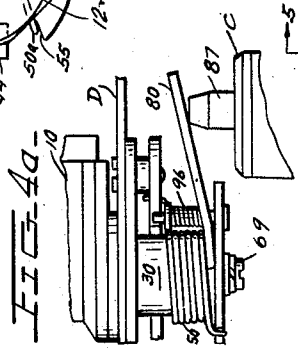
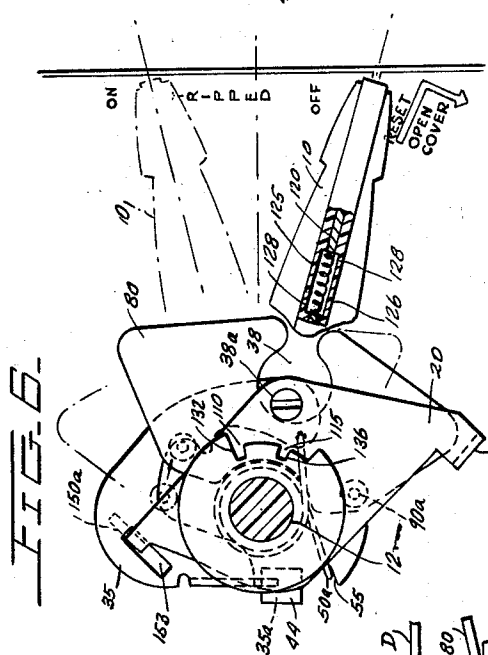
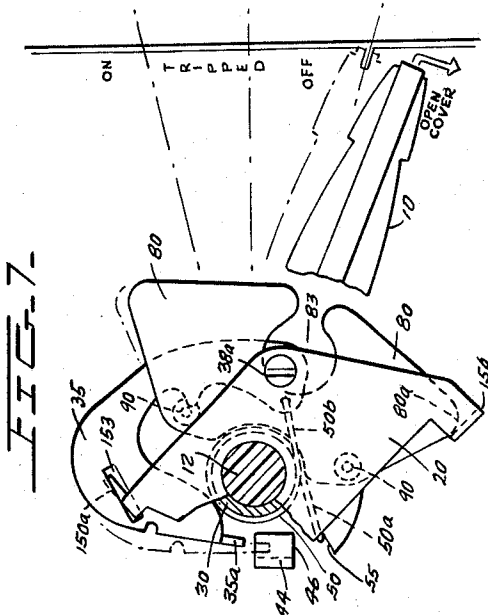
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CLOSING MECHANISM, MOLDED CASED BREAKERS

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FIG. 9.

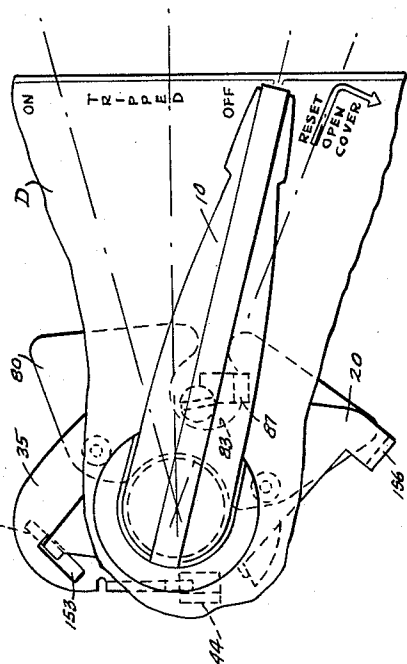


FIG. 11.

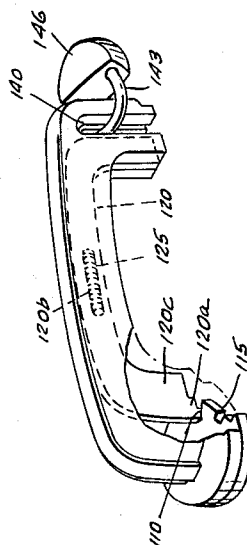


FIG. 8.

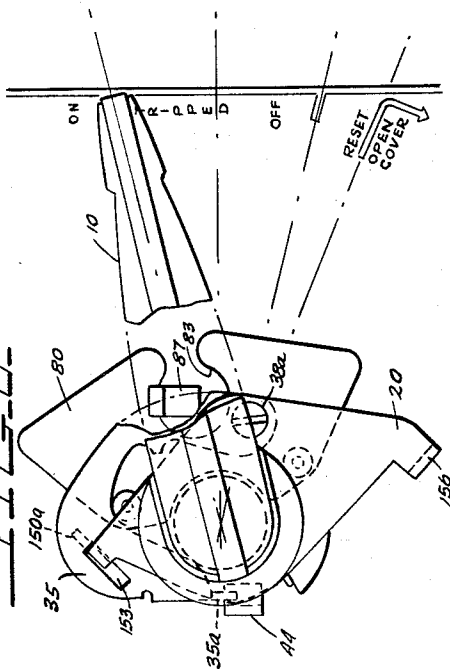
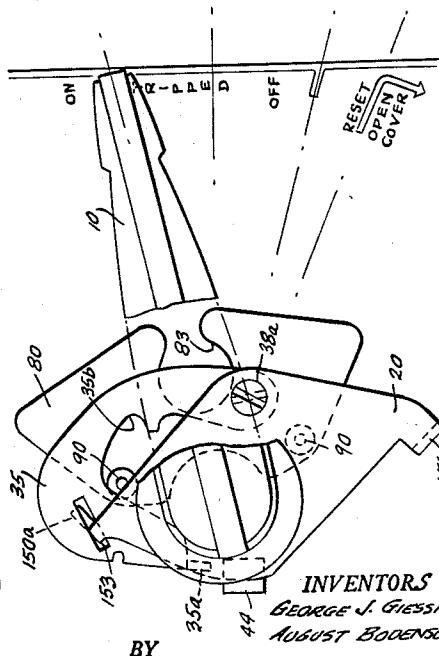


FIG. 10.



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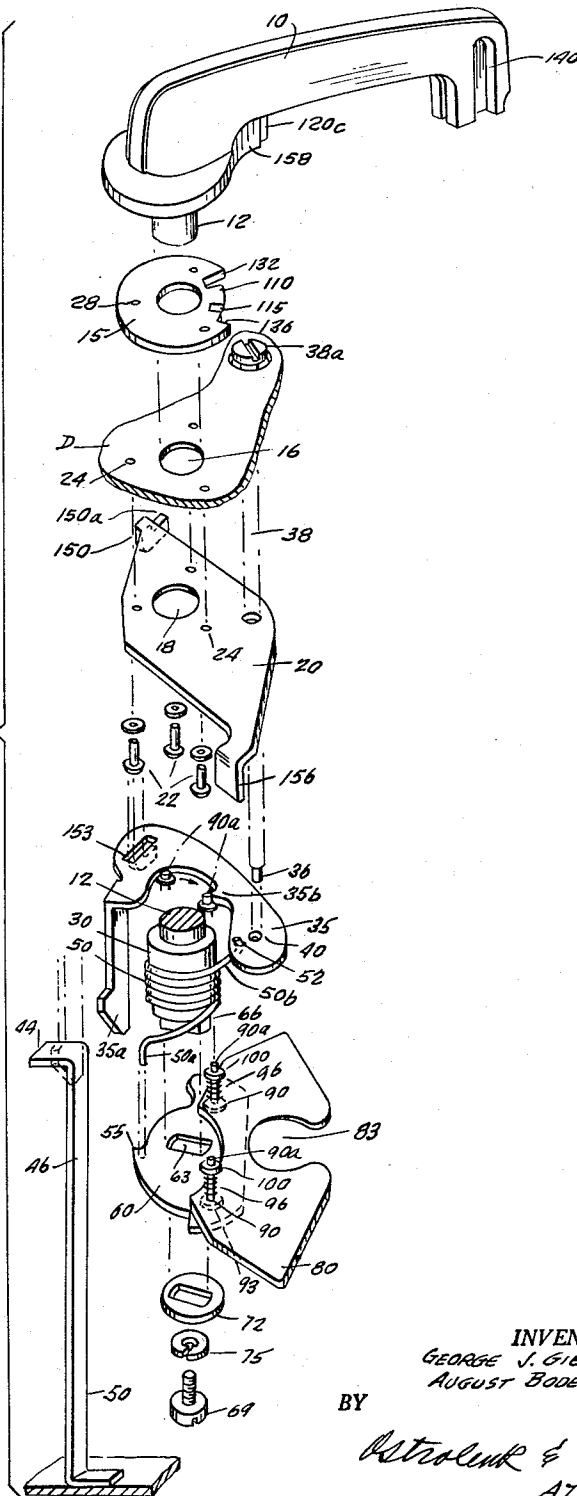
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CLOSING MECHANISM, MOLDED CASED BREAKERS

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Application April 8, 1954, Serial No. 421,753

22 Claims. (Cl. 200—50)

This invention relates to circuit breakers and more particularly to housings for circuit breaker units which may readily be placed integrally within said housing or removed therefrom, the housing being equipped with means for operating the handle of the breaker.

It is an object of the invention to provide a circuit breaker housing having a cover which will be latched in all positions of the circuit breaker handle.

It is another object of the invention to provide a control means for a circuit breaker comprising an exterior handle on the housing which may be locked in "on" or "off" positions by means of a padlock or several padlocks.

It is a further object of the invention to provide a housing for a circuit breaker unit having an exterior control handle which can be operated to reset the circuit breaker unit after it has opened, without opening the box or housing to expose the unit.

It is a still further object of the invention to provide a housing and control means for a circuit breaker unit such that the door or cover of the box will always be in latched condition except when the handle is moved to an extreme limit of arcuate motion.

It is another object of the invention to provide means whereby the cover of the housing may be opened even though the handle be locked by one or more padlocks in the "on" position, that is, the latch may be defeated under certain circumstances.

It is a still further object of the invention to provide means whereby defeating of the latch is prevented when the exterior control handle on the cover is locked in the "off" position.

It is an even further and very important object of the invention to provide the exterior control handle on the cover with means for engaging the circuit breaker handle interiorly of the box so that the cover may be closed regardless of the relative positions of the two handles without causing damage or breakage to the circuit breaker unit control handle.

In brief, the invention contemplates the provision of a box having a hinged cover which carries a rotary control handle exteriorly thereon. A plate is secured to the control handle interiorly of the cover for rotation by that handle, the plate being provided with a recess for engaging the circuit breaker unit control handle so as to effect motion thereof when the exterior handle is operated. An important feature of the invention resides in the mounting of the control plate just described; namely, such plate is resiliently mounted so that it can tilt in a direction toward the cover and away from the handle on the circuit breaker unit in the event any part of the surface of the plate should strike that handle when the cover is slammed shut. Thus, under such conditions, the circuit breaker unit control handle would merely cause the plate to rock or tilt on its mounting without causing any damage and operation of the exterior control handle would then be resorted to to align

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the recess in the control plate with the handle of the circuit breaker unit. In which case, the pressure causing tilting of the plate will be relaxed and the plate will snap into parallelism with the cover and thus, the exterior handle and the circuit breaker unit control handle will then be mechanically coupled so that the exterior handle can take over control functions.

Further, the invention contemplates a latching mechanism carried by the cover wherein the cover is always in latched condition with respect to the box, but wherein motion of the exterior handle to a reset position, at an extreme end of its arcuate path, will effect releasing of the latch so that the cover may be opened.

Should it be desired to open the cover when the exterior handle is in some intermediate position or even at the other extreme of its arcuate path, this can be done by a latch defeater mechanism having a slotted button exposed through the cover and accessible to a tool fitting into the slot to rotate the button. However, the construction and positioning of the button is such that it is covered by the exterior handle and not accessible when that handle is in the "off" position. Thus, a repairman placing the exterior handle to "off" position and padlocking it in such position may safely go about repair work without fear that some other person will inadvertently throw the handle to the "on" position or will be able to defeat the latch so as to open the breaker and throw the circuit breaker unit handle to the "on" position. Thus, the slotted button is completely obstructed by the exterior handle when the exterior handle is set at the "off" position according to an indicia plate provided on the front of the cover.

The construction is such that all functions of the circuit breaker unit can be effected without opening the cover; thus, the exterior handle can be swung from an "on" position to an "off" position and thereafter to a "reset" position at which position the latch holding the cover closed is released. The construction is also such that in the event of the opening of the circuit breaker unit due to overload, the exterior handle will then be driven by the circuit breaker unit handle to a position where it indicates "tripped" on the indicia plate so that the condition of the circuit breaker unit will be readily observable.

The invention further contemplates a combination of elements such that no moving parts thereof need be carried by the box itself, but in fact, the entire mechanism is carried on the door and may be readily assembled thereon except for a stationary latch element secured within the box.

Other objects and features of our invention will be apparent from the following description taken in conjunction with the appended drawing, in which:

Figure 1 is a front view of the cover of the box showing the exterior control handle in relation to the indicia plate, a portion of the cover being broken away to show certain elements of the mechanism.

Figure 2 is a section through 2—2 of Figure 1.

Figure 3 is a section through 3—3 of Figure 1.

Figure 4 is a section through 4—4 of Figure 1.

Figure 4a is an enlarged detail of the resilient protection for the handle.

Figure 5 is a fragmentary portion of the mechanism showing the handle and the latch when the handle is in reset position, thus releasing the latch.

Figure 6 is a fragmentary portion of the mechanism showing the means for locking the handle.

Figure 7 is a fragmentary portion of the mechanism showing the portion of certain of the parts when the handle is moved to open cover position.

Figure 8 is a fragmentary view of certain elements of

the mechanism showing the accessibility of the element for defeating the latch.

Figure 9 is a fragmentary view of elements of the mechanism showing their position when the defeating element is obstructed by the handle.

Figure 10 is a fragmentary view of certain elements of the invention showing their position after the latch has been released.

Figure 11 is a perspective showing details of the exterior handle.

Figure 12 is an exploded view showing the general relationship of the several elements comprising the mechanism.

In Figures 1, 2 and 3, a circuit breaker unit B is shown enclosed within a housing or box C, the box having a door or lid D hinged thereto at the top in a conventional manner. The usual gasket E may be provided, the box being suitably fastened to a wall as by the bracket F.

A description of the mechanism will now be given with particular reference to Figure 12 and as otherwise noted.

The invention as viewed on Figure 12 comprises a composition handle 10 integral with a shaft 12 molded thereto, the shaft passing through a bore 14 in a notched locking plate 15 fastened exteriorly on the cover or door D, and thence, through a bore 16 in the door D, and through a bore 18 in a mounting plate 20 fastened interiorly to the door. The elements 15 and 20 are secured to the door by means of bolts 22 passing through holes, such as 24, and having threaded engagement in aligned holes 28 in plate 15. Shaft 12 has a collar 30 surrounding it which is stationary and press fitted in bores 16 and 18.

Carried on the mounting plate 20 is a latch plate 35, having a latch hook 35a, which is pivoted to the mounting plate by the end 36 of a shaft 38 passing through a bore 40 and peened at 42 so as to grip the latch plate 35, as best seen on Figure 4. Shaft 38 has an integral slotted button 38a. Latch hook 35a can engage an ear 44 of a member 46 fastened to the back wall of the casing at 48 to lock door D closed.

Plate 35 is provided with a cam surface 35b, for a purpose to be hereinafter described, the cam surface having a fairly steep contour.

A spring 50 surrounds collar 30 with sufficient radial clearance so that it can be wound at least a partial turn without binding on the collar. One end of the spring is suitably secured in a small bore 52 in the latch plate 35 while the other end bears in a hook-like recess 55 in an actuator plate 60. The plate 60 is provided with a rectangular slot 63 which keys the plate 60 to the rectangular end 66 of shaft 12. A bolt 69 and conventional washer assembly consisting of washers 72 and 75 are provided wherein bolt 69 fastens together shaft 12 and actuator plate 60 for integral rotation when handle 10 is rotated.

Plate 60 carries a circuit breaker handle engaging plate 80 having an opening 83 for accommodating handle 87 of the manual type circuit breaker B, as shown in Figures 3, 4, 8 and 9. The plate 80 is resiliently mounted on plate 60 by means of two studs 90 which are fastened to plate 60 and pass through oversize holes 93 in plate 80, there being a spring 96 around each stud and held thereon by a clamp washer 100.

One of the studs 90 has a trip 90a (Figure 10) which is engagable with cam edge 35b to effect rotation of plate 35 thereby to disengage hook 35a from ear 44. Thus, as viewed on Figure 12, clockwise rotation of plate 60, keyed to handle 10, serves to bring stud end 90a into engagement with the sharp rise 35b of the cam edge. This effects a quick unlatching clockwise rotation of plate 35 from the hook engaged condition shown in phantom, in Figures 5 and 12, it being noted that due to the position and shape of cam edge 35b, only the last few degrees of rotation of handle 10 is effective to

achieve rotation of plate 35 and opening of door D.

The springs 96 are provided with a suitable degree of initial compression, but permit plate 80 to rock with respect to plate 60 in the event door D is slammed shut when recess 83 is not aligned with handle 87. Thus, the door can be closed at any time without danger of breakage of handle 87 should it be struck by plate 80 since the plate can be rocked or tilted outwardly towards the door by handle 87 (Figure 4a). The handle 10 can thus be rotated with plate 80 in the tilted condition until handle 87 of the circuit breaker "finds" recess 83 at which time plate 80 snaps into proper operating position, as shown in Figure 4, the handle 87 then being encompassed by recess 83.

Thus, no matter what position handle 10 is in at the time the door is closed, no breakage of the handle 87 of the circuit breaker can occur, because of the resilient mounting of plate 80 on plate 60 which permits plate 80 to tilt away from handle 87 until the recess 83 is aligned with it as exemplified in Figures 8 and 9.

Accordingly, it will be understood that motion of handle 10 will serve to rotate, through shaft 12, the actuator plate 60 and plate 80, thus controlling handle 87 to "on" or "off" position, depending upon the position of the handle 10, it being understood that the size of recess 83 is suitably designed so that the arcuate sides of the recess engage handle 87 on one side or the other thereof to compel motion past a dead center position and to effect full motion of handle 87 to either of its extreme limits, the lower limit being to "reset" position as shown on the indicia plate P.

In order to effect locking of the handle in either "on" or "off" position, there are provided a pair of notches 110 and 115 in plate 15 which are radially aligned with the respective "on" "off" indicia of the door D. These notches coact with a slidable locking pin 120 (Figures 4 and 11) in handle 10 and having a forward edge 120a which can engage in either of the notches 110 or 115, being shown in notch 110 in Figure 11. Pin 120 is substantially of "U" shape so as to allow space for the fingers of an operator to fully grasp handle 10 (Figure 4). The locking pin 120 is carried in a slot 122 molded in handle 10 and a spring 125 is carried in a slot 120b in locking pin 120, slot 122 in handle 10 being widened to form a recess 126 to accommodate spring 125, as shown in Figure 6. Thus, the spring ends about the shoulders 128 at the ends of the recess 126, and the spring being under initial compression biases pin 120 to outward position so that a tab 120c which is formed at the extreme forward end of the pin 120 normally protrudes outwardly of the end of handle 10 (Figures 4 and 6), the outer edge of the handle being sufficiently slotted to permit tab 120c to protrude therethrough.

Accordingly, by manual pressure on tab 120c, pin 120 can be thrust to the left, as shown on Figure 4, against the bias of spring 125 so that edge 120a may be inserted in either notch 110 or 115 of latch plate 28, depending on whether handle 10 is at the "on" or the "off" position, as will be clear from Figures 4 and 6, pin 120 being locked in notch 110 in Figure 4 for the "on" position, while Figure 6 shows pin 120 radially aligned for locking in notch 115 for the "off" position.

Plate 15 is provided with shoulders 132 and 136, shoulder 132 being a wall of notch 110 while shoulder 136 is offset from 115. Shoulders 132 and 136 serve as stops to limit motion of handle 10 in either direction since pin 120 will engage shoulder 132 at the "on" position, and will engage shoulder 136 at the "reset" position. Pin 120 is then biased out of engagement with plate 15 by spring 125, as will be understood from the foregoing description, but edge 120a is always within the confines of the shoulders.

Handle 10, at its forward end, is provided with a sizable aperture 140, open at the bottom, to permit in-

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section of pin 120 during assembly. Aperture 140 is suitable to accommodate the hasp 143 of one or more padlocks 146 (Figure 11). Normally, the aperture 140, when pin 120 is biased outwardly, is blocked by the forward edge 143 (Figure 4) of the pin; when, however, aperture 140 is cleared by rearward pushing of tab 120c, the padlock hasp can be inserted in the aperture, the bottom of which is always maintained blocked by tab 120c to retain the hasp.

Accordingly, it will be seen that pin 120 can be utilized to lock in either notch 110 or 115, and with the padlock hasp in aperture 140, the pin is prevented from moving outward since the portion comprising edge 143 of pin 120 is blocked by the hasp, thus, handle 10 is lockable in either the "on" or "off" position, but not in any other position.

Spring 50 lightly biases the handle 10 toward "on" position when the door D is open and handle 87 of the circuit breaker is not engaged in recess 83. Spring 50 also biases hook 35a toward latching engagement with ear 44; thus, as hereinabove described, rotating handle 10 to "reset" effects engagement of stud end 90a with cam rise 35b to release hook 35a from ear 44, the end 50a of spring 50 being wound to tighten the spring whence spring end 50b effects clockwise rotation of plate 35, reducing the diameter of the spring slightly, but not enough to bind on collar 30 owing to the initial radial spacing hereinabove mentioned.

In order to open the door D, when pin 120 is locked in notch 110, the "on" position of handle 10, the shaft 38 is rotated clockwise (Figure 1) by a suitable screw driver tool inserted in the partially accessible slot of button 38a (Figure 8) and rotated to rotate hook 35a out of engagement with ear 44 (Figure 10).

Although spring 50 maintains plate 35 toward hook engaging position, as stated, when handle 10 is swung to "reset," stud end 90a engages cam edge 35b to rotate plate 35 and thus unlock the door, full motion of the handle down to "reset" being required, a safety feature being thus effected.

In order to limit the arcuate motion of plate 35, the mounting plate 20 is provided with an ear 150 which is freely slidable in a slot 153 in plate 35 being shown therein in phantom in Figure 12. Thus, the arcuate travel of plate 35 is stopped by engagement of the edges of ear 150 with the respective ends of slot 153. Ear 150 has a tab 150a which overlaps the end of the slot to serve as a retainer for plate 35 so that it will not be bent away from the door by tension exerted by locking engagement with hook 44. The tab 150a is of suitable dimension to always overlap the end of the slot toward which it points or the surface of plate 35 at the side of the slot, so that it will provide sliding support for the plate at any rotated position thereof.

Plate 20 has an ear 156 bent therefrom; thus, as shown in Figures 5 and 7, the extreme corner 80a of plate 80 overlies to a slight degree the corner 156a of ear 156 when the handle 10 is in extreme downward or "reset" position. This prevents tilting of plate 80 toward the door at this time so that plate 80 will remain parallel thereto in the extreme downward position of handle 10.

In order to prevent defeating the latch 35a, and thereby opening of the door D when the handle is in the "off" position and locked by a padlock in that position, the handle 10 is provided with an integrally molded projection 158, as shown in Figures 3 and 9, which closely overlies button 38a so that access to the slot in the button cannot be had. Thus, a repairman working on the line will not be endangered by having current turned on since the door cannot then be opened by defeating the latch provided, of course, one or more padlocks are used to ensure the handle remaining in the locked "off" position.

By virtue of the rotative mounting of plates 60 and 80, should the breaker open, the handle 87 thereof will snap

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downward carrying with it rotatively the plates 60 and 80 along with handle 10 to indicate "tripped" on the indicia plate. Should the handle be padlocked at "on" position, it cannot move, but in such case plate 80 will tilt toward the door, being forced to do so by motion of the circuit breaker handle 87 so that the breaker will not be prevented from opening.

In order to reset the breaker after it has opened, it is merely necessary to move handle 10 to "reset" position and then upwardly to the "on" position.

In summation, it will thus be seen from the above description that door D is always latched closed by engagement of hook 35a with ear 44 unless such engagement is deliberately broken by rotation of button 38a. Further, button 38a is not accessible to defeat the latch when handle 10 is at "off" position. In addition, resetting of the breaker is accomplished by handle 10 and there is no need to open door D for this purpose. However, the door can be opened, if desired, by moving handle 10 to the "reset" position. Finally, handle 10 may be locked in either the "on" or "off" positions by one or more padlocks without preventing opening of the breaker when padlocked in the "on" position.

Having thus described our invention, we are aware that various changes may be made without departing from the spirit thereof. Accordingly, we do not seek to be limited to the precise embodiment illustrated herein except as set forth in the appending claims.

We claim:

1. In a box for a circuit breaker unit wherein said unit has a manually operable handle, a cover for said box, a rotary handle mounted exteriorly on said cover, an actuator element carried at the interior side of said cover and rotatable by said handle; said actuator element having engagement means alignable with said circuit breaker handle for engagement with and actuation thereof; and resilient mounting means for said actuator element, whereby said element is depressible by said unit handle towards said cover in the event said cover is closed when said engagement means is misaligned with said unit handle, so as to prevent breakage thereof.

2. In a box for a circuit breaker unit wherein said unit has a manually operable handle, a cover for said box, a rotary handle mounted exteriorly on said cover, an actuator element carried at the interior side of said cover and rotatable by said handle; said actuator element having engagement means alignable with said circuit breaker handle for engagement with and actuation thereof; and resilient mounting means for said actuator element, whereby said element is depressible by said unit handle towards said cover in the event said cover is closed when said engagement means is misaligned with said unit handle, so as to prevent breakage thereof; said actuator element comprising a plate; said engagement means comprising an aperture in said plate having edges engageable with said handle.

3. In a box for a circuit breaker unit wherein said unit has a manually operable handle, a cover for said box, a rotary handle mounted exteriorly on said cover, an actuator element carried at the interior side of said cover and rotatable by said handle; said actuator element having engagement means alignable with said circuit breaker handle for engagement with and actuation thereof; and resilient mounting means for said actuator element, whereby said element is depressible by said unit handle towards said cover in the event said cover is closed when said engagement means is misaligned with said unit handle, so as to prevent breakage thereof; said resilient mounting means comprising a support element carried by and keyed to said handle, said actuator element being carried by said support element and being joined thereto by retaining means comprising flexible elements.

4. In a box for a circuit breaker unit wherein said unit has a manually operable handle, a cover for said box, a rotary handle mounted exteriorly on said cover, an

actuator element carried at the interior side of said cover and rotatable by said exterior rotary handle; said actuator element having engagement means alignable with said circuit breaker handle for actuation thereof and resilient mounting means for said actuator element whereby said element is depressible towards said cover in the event said cover is closed when said engagement means is misaligned with said circuit breaker unit handle so as to prevent breakage thereof; said actuator element comprising a plate; said engagement means comprising an aperture in said plate having edges engageable with said handle; said resilient mounting means comprising a support element carried by and keyed to said handle; said actuator element being carried by said support element and being joined thereto by retaining means comprising flexible elements.

5. In a box for a circuit breaker unit wherein said unit has a manually operable handle, a cover for said box, a rotary handle mounted exteriorly on said cover, an actuator element carried at the interior side of said cover and rotatable by said exterior rotary handle; said actuator element having engagement means alignable with said circuit breaker unit handle for actuation thereof; resilient mounting means for said actuator element whereby said element is depressible towards said cover by said latter handle in the event said cover is closed when said engagement means is misaligned with said latter handle so as to prevent breakage thereof; said actuator element comprising a plate; said engagement means comprising an aperture in said plate having edges engageable with said handle; said resilient mounting means comprising a support element carried by and keyed to said exterior rotary handle; said actuator element being carried by said support element and being flexibly joined thereby; retaining means comprising flexible elements; said retaining means comprising stud members intermediate said support and actuator elements; and spring means compressively disposed between said support and actuator elements, one of said latter elements being loosely retained by said stud members.

6. A box for a circuit breaker unit comprising a cover having an exterior handle thereon and control means actuated by said handle for engaging and controlling said circuit breaker unit; latch means for latching said cover to said box and means for locking said handle in a plurality of selective positions on said box from a single point on said exterior handle.

7. A box for a circuit breaker unit comprising a cover having an exterior handle thereon and control means actuated by said handle for engaging and controlling said circuit breaker unit; latch means for latching said cover to said box and means for locking said handle in a plurality of selective positions on said box from a single point on said exterior handle; release means for unlatching said cover in a predetermined position of said handle; said release means being automatically operated by motion of said handle.

8. A box for a circuit breaker unit comprising a cover having an exterior handle thereon and control means actuated by said handle for engaging and controlling said circuit breaker unit; latch means for latching said cover to said box and means for locking said handle in a plurality of selective positions on said box from a single point on said exterior handle; means for releasing said latch means; said means having an element exposed for manual actuation in a predetermined position of said handle and being movable independently of said handle.

9. A box for a circuit breaker unit comprising a cover having an exterior handle thereon and control means actuated by said handle for engaging and controlling said circuit breaker unit; latch means for latching said cover to said box and means for locking said handle in a plurality of selective positions on said box from a single point on said exterior handle; including release means for unlatching said cover in a predetermined posi-

tion of said handle; said release means being automatically operated by motion of said handle; including means for releasing said latch means; said means having an element exposed for manual actuation in a predetermined position of said handle and being movable independently of said handle; all of said aforementioned means being carried on said cover.

10. A box for a circuit breaker unit comprising a cover having an exterior handle thereon and control means actuated by said handle for engaging and controlling said circuit breaker unit, including latch means for latching said cover to said box comprising a movable latch element carried by said cover engageable with a complementary stationary latch element carried by said box, including means carried by said cover for biasing said movable latch element to engaging position with said complementary latch element, and unlatching means carried by said cover for moving said movable element out of latching engagement by motion of said handle, said unlatching means comprising a stud movable with said handle, a cam surface provided on said movable latch element, said stud being engageable with said cam surface for actuating said movable latch element to disengage from said stationary latch element.

11. A box for a circuit breaker unit comprising a cover having an exterior handle thereon and control means actuated by said handle for engaging and controlling said circuit breaker unit, including latch means for latching said cover to said box comprising a movable latch element carried by said cover engageable with a complementary stationary latch element carried by said box, including means carried by said cover for biasing said movable latch element to engaging position with said complementary latch element, and unlatching means carried by said cover for moving said movable element out of latching engagement by motion of said handle, said unlatching means comprising a stud movable with said handle, a cam surface provided on said movable latch element, said stud being engageable with said cam surface for actuating said movable latch element to disengage from said stationary latch element, said handle being movable between two extreme positions, said cam surface being disposed relative the path of travel of said stud so that said handle is substantially at one extreme position when said movable latch element is actuated to disengage from said stationary latch element.

12. A box for a circuit breaker unit comprising a cover, an exterior rotary handle means carried by said cover, means actuated by said handle for actuating said circuit breaker unit, and means for locking said handle in a predetermined position comprising an element carried by said handle and being manually movable with respect thereto, including a stationary element carried by said cover and having means engageable by said movable element to prevent motion of said handle, an aperture in said handle in which a padlock may be secured to prevent movement of said handle by maintaining said movable element in engagement with said stationary element.

13. A box for a circuit breaker unit comprising a cover, an exterior rotary handle means carried by said cover, means actuated by said handle for actuating said circuit breaker unit, and means for locking said handle in a predetermined position comprising an element carried by said handle and being manually movable with respect thereto, including a stationary element carried by said cover and having means engageable by said movable element to prevent motion of said handle, an aperture in said handle in which a padlock may be secured to prevent movement of said handle by maintaining said movable element in engagement with said stationary element wherein said handle is slotted longitudinally, said movable element being slidable in said slot, resilient means for biasing said element toward unlocked position.

said movable element having an edge engageable by said padlock within the confines of said aperture.

14. A box for a circuit breaker unit having a handle positionable to "current on," "current off" and "reset" positions; a cover carried by said box; a rotary handle on the exterior of said cover and carried thereby, said handle having a shaft passing through an aperture in said cover; a lock plate secured to said cover on the exterior thereof and concentric with said shaft; a pair of angularly spaced notches in said lock plate, said lock plate being provided with shoulder means angularly spaced from each other, said notches being within the arcuate limits of said shoulder means; a lock pin slidably carried by said handle and selectively engageable with said notches to hold said handle in respective "current on" or "current off" positions, said lock pin being engageable with said shoulders to effect the extreme limits of rotary travel of said exterior handle, said lock pin having an exposed portion operable to effect locking engagement in one of said notches, including aperture means in said handle to accommodate a padlock for blocking return motion of said lock pin when engaged with one of said notches.

15. A box for a circuit breaker unit comprising a cover; an exterior rotary handle carried by said cover; control means carried by said handle within said box for engagement with the control handle of a circuit breaker unit for effecting selective positioning thereof; said rotary handle having a shaft to which said control means is secured; a latch element pivotally carried by said cover and being engageable with a coacting latch element secured within said box to latch said cover in closed condition; a spring means intermediate said control element and said pivotal latch element biasing said elements in opposite rotary directions wherein said pivotal latch element is biased toward latching engagement; stud means carried by said control element; said pivotal latch element being provided with a cam edge engageable by said stud means to provide pivotal motion of said pivotal latch element to effect disengagement of said latch elements upon a predetermined degree of motion of said exterior rotary handle; said control element comprising a pair of plates, one of which is secured immovably relative said shaft and the other of which is carried by said relatively immovable plate, wherein said stud means serves to retain said other plate to said relatively immovable plate, said other plate being tiltable out of parallelism with respect to said relatively immovable plate and having a recess therein to accommodate the handle of a circuit breaker unit within said box for actuation thereof when said exterior rotary handle is operated, including resilient means for normally maintaining parallelism of said relatively immovable plate and said other plate, whereby said other plate may tilt when said cover is closed at times when said recess is misaligned with said circuit breaker handle to prevent breakage thereof.

16. A box for a circuit breaker unit comprising a cover having an exterior handle thereon and control means actuated by said handle for engaging and controlling said circuit breaker unit, including latch means for latching said cover to said box comprising a movable latch element carried by said cover engageable with a complementary stationary latch element carried by said box, including means carried by said cover for biasing said movable latch element to engaging position with said complementary latch element, and unlatching means carried by said cover for moving said movable element out of latching engagement by motion of said handle, said unlatching means comprising a stud movable with said handle, a cam surface provided on said movable latch element, said stud being engageable with said cam surface for actuating said movable latch element to disengage from said stationary latch element, and a release means being operable independently of said handle and

comprising a movable element disposed relative to said handle so as to be accessible when said handle is in a predetermined position relative to said cover but inaccessible by virtue of being obstructed by said handle when said handle is in another predetermined position.

17. In a casing provided with an operable cover having an operating handle mounted thereon, switch mechanism mounted in said casing having an actuating lever projecting towards said cover, and means providing a separable connection between said operating handle and said actuating lever, said means comprising a member carried by said cover and having an aperture formed complementary to said lever and adapted for the reception of the latter to provide an operative connection between said handle and lever, said member being yieldably mounted on said cover whereby to provide for the reception of said lever in said aperture upon the movement of said handle to a position corresponding to said lever when said handle and lever are in non-corresponding positions on the closing of said cover, and means for releasably locking said cover in a closed position and for locking said handle in a predetermined position.

18. In a casing provided with an operable cover having an operating handle mounted thereon, switch mechanism mounted in said casing having an actuating lever projecting towards said cover, and means providing a separable connection between said operating handle and said actuating lever, said means comprising a member carried by said cover and having an opening formed complementary to said lever and adapted for the reception of the latter to provide an operative connection between said handle and lever, said member being yieldably mounted on said cover whereby to provide for the reception of said lever in said opening upon the movement of said handle to a position corresponding to said lever when said handle and lever are in non-corresponding positions on the closing of said cover; a first means for releasably locking said cover in a closed position, and a second means for locking said handle in a predetermined position.

19. In a casing provided with an operable cover having an operating handle mounted thereon, switch mechanism mounted in said casing having an actuating lever projecting towards said cover, and means providing a separable connection between said operating handle and said actuating lever, said means comprising a member carried by said cover and having an aperture formed complementary to said lever and adapted for the reception of the latter to provide an operative connection between said handle and lever, said member being yieldably mounted on said cover whereby to provide for the reception of said lever in said aperture upon the movement of said handle to a position corresponding to said lever when said handle and lever are in non-corresponding positions on the closing of said cover.

20. In a casing provided with an operable cover having an operating handle mounted thereon, switch mechanism mounted in said casing having an actuating lever projecting towards said cover, and means providing a separable connection between said operating handle and said actuating lever, said means comprising a member carried by said cover and having an aperture formed complementary to said lever and adapted for the reception of the latter to provide an operative connection between said handle and lever, said member being yieldably mounted on said cover whereby to provide for the reception of said lever in said aperture upon the movement of said handle to a position corresponding to said lever when said handle and lever are in non-corresponding positions on the closing of said cover, and means for releasably locking said cover in a closed position.

21. In a casing provided with an operable cover having an operating handle mounted thereon, switch mechanism mounted in said casing having an actuating lever projecting towards said cover, and means providing a sep-

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arable connection between said operating handle and said actuating lever, said means comprising a member carried by said cover and having an aperture formed complementary to said lever and adapted for the reception of the latter to provide an operative connection between said handle and lever, said member being yieldably mounted on said cover whereby to provide for the reception of said lever in said aperture upon the movement of said handle to a position corresponding to said lever when said handle and lever are in non-corresponding positions on the closing of said cover and for locking said handle in a predetermined position.

22. In a casing provided with an operable cover having an operating handle mounted thereon, switch mechanism mounted in said casing having an actuating lever projecting towards said cover, and means providing a separable connection between said operating handle and said actuating lever, said means comprising a member car-

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ried by said cover and having an aperture formed complementary to said lever and adapted for the reception of the latter to provide an operative connection between said handle and lever, said member being yieldably mounted on said cover whereby to provide for the reception of said lever in said aperture upon the movement of said handle to a position corresponding to said lever when said handle and lever are in non-corresponding positions on the closing of said cover; a first means for releasably locking said cover in a closed position, and a second means for locking said handle in a predetermined position.

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